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The Effects of Anonymous and Non-Anonymous Online Peer Review on Feedback Types and Students' Revisions in Second-Language Writing

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De Effecten van Anonieme en Niet-Anonieme Online Peer Review op Soorten Feedback en Revisie bij Schrijfvaardigheid in een Vreemde Taal

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Abstract

A promising tool for writing improvement is the use of online peer review, which has become available since the introduction of computer mediated technology in classrooms. One of the possibilities offered by online peer review is the use of anonymity, which has been found to reduce the perception of peer pressure in educational settings. This research examines the effect of anonymous and non-anonymous peer review in second-language writing education. More specifically, it investigates the effect of anonymity and non-anonymity on different types of peer feedback (higher-order and lower-order concerns / directive and non-directive), revisions and writing performance.

The research was conducted in the spring of 2018 with 114 second-year university students, age 18 to 24. These students were enrolled in an English writing course as part of the regular programme. Ten groups of students were randomly assigned to two experimental conditions: five anonymous and five non-anonymous groups (no level groups). In this quasi-experimental field study, 53 students received online peer review anonymously, and 47 students non-anonymously (114 students acted as assessor, 100 as assessee since some essays were excluded from the research as the first drafts were too short). Students uploaded their first draft of a five-paragraph essay in English, before they offered online peer feedback to two fellow students in class.

All peer review comments were collected, segmented and coded. Building on previous research, the revision-oriented comments were categorised as directive or non-directive and higher-order or lower-order concerns. Directive feedback included specific suggestions whereas non-directive feedback involved nonspecific observations without solutions, leaving it to the students to self-correct the text. Higher-order concerns included development of ideas, audience and purpose, style, organisation and argumentation while lower-order concerns involved spelling, grammar, wording and punctuation. These categories were combined in four types of feedback: directive feedback on higher- and lower order concerns and non-directive feedback on higher- and lower order concerns. Subsequently, students' first drafts were compared to their final drafts to check whether the feedback items were processed, partly processed or not processed. Finally, analyses were run on all data including the final grades for the writing module.

Results showed that students in the anonymous condition provided significantly more feedback on higher-order concerns and offered significantly different types of feedback. As for revision, although assessees in the anonymous condition did not process more feedback than their non-identified peers (adoption rate), there was a difference in the revision of feedback between the two conditions; while

directive, lower-order feedback was processed by students in both the anonymous and non-anonymous condition, directive, higher-order feedback was processed more by assessees in the anonymous condition. On top of that, students in the anonymous condition scored significantly higher final grades than students in the non-anonymous group. The relationship between anonymous and non-anonymous condition and final grades was significantly moderated by both revision and trust in the assessor, although these both accounted for only a small part of the variance.

In this study, anonymity affected the types of feedback students gave, it affected revision, and it was also significantly related to higher final grades. These results provide some insights on the impact of anonymity on the online peer review process. It seems to suggest that anonymity could be used to optimise the success of online peer review in the writing process for second-language learners.

Key words: online peer review, anonymity, (non)directive peer feedback, Higher- and lower-order concerns, second language, revision

Samenvatting

Schrijfvaardigheid is belangrijk voor het studiesucces van studenten. Sinds de opmars van blended learning is het mogelijk om in de klas online peer review aan te bieden, dit wordt beschouwd als een veelbelovende aanpak bij het verbeteren van schrijfvaardigheid. Er is vooralsnog weinig onderzoek beschikbaar naar het effect van online peer review in de praktijk. Een van de mogelijkheden die online peer review biedt is de inzet van anonimiteit onder studenten. Dit is interessant aangezien anonimiteit in onderwijssituaties in verband wordt gebracht met het vermindering van peer pressure. Dit onderzoek is opgezet om meer inzicht te krijgen in de manier waarop online peer review ingezet kan worden bij het aanleren van schrijfvaardigheid in een tweede taal en met name in de rol die anonimiteit daarbij kan spelen. Het onderzoekt de effecten van anonimiteit en niet-anonimiteit op verschillende soorten feedback die studenten geven (directief en niet directief, hogere en lagere orde feedback), op revisie en op de eindresultaten Engels schrijfvaardigheid.

Het onderzoek vond plaats in het voorjaar van 2018. Deelnemers aan het onderzoek waren 114 tweedejaars hbo-studenten in de leeftijd 18 tot 24. Zij volgden de module Engels schrijfvaardigheid als onderdeel van het reguliere programma. Vijf klassen waren opgesplitst en de tien halve groepen werden willekeurig ingedeeld in de anonieme en niet-anonieme situatie (er waren geen niveaugroepen). In dit quasi-experimentele onderzoek ontvingen 53 studenten de peer review opmerkingen anoniem en 47 studenten ontvingen niet-anonieme feedback (totaal 114 assessoren en 100 assessees; enkele studenten die een incomplete eerste versie hadden geüpload, werden uit het onderzoek werden verwijderd). Voorafgaand aan de les waarin studenten aan twee medestudenten online feedback gaven, uploadden zij de eerste versie van hun Engelstalig vijf-paragrafen-essay.

Alle feedback werd verzameld, gesegmenteerd en gelabeld. Voortbouwend op bestaand onderzoek werden alle feedback items die een mogelijke verandering suggereerde gelabeld als directief of niet directief en als hogere orde of lagere orde aspecten. Directieve opmerkingen waren specifiek en gaven een suggestie voor een mogelijke aanpassing, non-directieve feedback bevatte non-specifieke feedback zonder advies waarbij de schrijver zelf een verbetering moest bedenken. Hogere orde aspecten verwezen naar ideeontwikkeling, aansluiting bij het lezerspubliek, doel, stijl, organisatie en argumentatie. Lagere orde aspecten bevatten opmerkingen over spelling, grammatica, woordkeus en interpunctie. Deze twee labels werden gecombineerd in vier types feedback; directieve feedback op hogere orde aspecten en op lagere orde aspecten en niet directieve feedback op hogere orde aspecten en op lagere orde aspecten. Vervolgens werden de eerste versies van de vijf-paragrafen essays en gereviseerde, definitieve essays vergeleken om voor ieder afzonderlijk feedback item te bekijken of het was verwerkt, deels verwerkt of niet verwerkt. Alle data, inclusief de eindcijfers voor de module, werd samengevoegd en gebruikt voor analyse.

Onderzoeksresultaten toonden aan dat de feedback gegeven door studenten in de anonieme groep significant meer hogere orde aspecten bevatte dan de feedback items van de niet-anonieme groep, plus er bestond een significant verschil in de vier types feedback die beide groepen gaven. Hoewel studenten in de anonieme en niet-anonieme groep min of meer eenzelfde aantal feedback items verwerkten (adoption rate), bestond er tussen de twee groepen een significant verschil in de soorten feedback die gebruikt werden voor revisie: verwerking van directieve, lagere orde feedback kon worden verklaard voor zowel studenten uit de anonieme als uit de niet-anonieme groep, terwijl verwerking van feedback op directieve, hogere orde aspecten alleen dit effect had op de anonieme assessees. Bovendien scoorden de studenten in de anonieme groep significant hogere eindcijfers dan hun niet-anonieme medestudenten. De relatie tussen anonimiteit en de eindcijfers werd gemodereerd door zowel revisie (het verwerken van feedback) als door het vertrouwen dat assessees hadden in de assessoren. Een kanttekening hierbij is dat beide effecten slechts een klein deel van de variantie verklaarden.

In deze onderzoeksopzet bleek dat anonimiteit een significante invloed had op het type feedback dat studenten elkaar gaven, op de revisie van verschillende types feedback en er bleek een significante relatie te bestaan tussen anonimiteit en de hoogte van de eindcijfers. Deze resultaten lijken te bevestigen dat anonimiteit impact kan hebben op het online peer review proces en dat het kan worden ingezet om het schrijfproces van studenten in een tweede taal te ondersteunen.

1. Introduction

1.1 Writing skills and peer review

Good writing skills help students to communicate their ideas effectively, to express their thoughts and emotions and to influence others. As such, it constitutes an indispensable tool for learning (Graham, Gillespie &, McKeown, 2013). Moreover, a student's writing skills are a sound predictor of academic success as it improves their reading skills and comprehension (Graham & Hebert, 2010). In other words, being able to write is a vital necessity for civic, economic and educational participation. Consequently, writing is an important subject in educational studies. It is also a pressing issue as research has shown that many teachers feel unprepared to teach writing and often have no knowledge of evidence-based instructional strategies (Graham & Hebert, 2010; Graham et al., 2013).

With a long history in writing instruction, peer review has been considered a critical aspect to the improvement of writing skills (Cho & MacArthur, 2010; Yu & Lee, 2016). The peer review process, in which students help each other correct and improve their writing by giving feedback on each other's texts, is an integrated part of a collaborative and interactive learning process which requires active involvement of students (Gielen, Peeters, Dochy, Onghena, & Struyven, 2010; Van Gennip, Segers, & Tillema, 2010). Unlike peer assessment where students evaluate and grade each other, peer review is a formative tool in which students help each other improve in areas such as logical thinking, grammar, vocabulary and other content and structural factors (Wu, Petit, & Chen, 2015). Liu and Carless (2006) considered the qualitative and formative feedback comments of peers to be more effective than grading or assessing. Peer feedback on writing has empirically been proven to have numerous advantages, particularly in "reciprocal teaching, providing peer help, receiving explanations, co-constructing ideas, resolving conflicts, and negotiating meaning" (Ge & Er, 2005, p. 146). In this thesis, the term "peer feedback" refers to peer feedback on texts, i.e. interchangeable with the term "peer review" as exemplified in the works of Cho and MacArthur (2010) as well as Yu and Lee (2016). Students in general have positive perceptions of peer review processes (Lu & Bol, 2007).

Since the introduction of computer mediated technology, classroom practice has become more blended and this has created the possibility of students offering each other online peer review. This has also enabled students from different classes to collaborate online, at different moments in time. Although positive effects have been found for the use of computer-mediated technology in the peer review process (Liou & Peng, 2009), empirical research on the impact of instructional interventions, conditions and circumstances of online peer review on effectiveness and learning remains limited (Cho & MacArthur, 2010; Van Popta, Kral, Camp, & Martens, 2017). To harness technological affordances effectively, it is essential for teachers to know which learning conditions and instructional scaffolds lead to effective and successful online peer review. Hence, this study addresses the role of

anonymity in the online peer review process and the effect it has on students' writing performance. Insight into these issues might help to address the challenges teachers face in designing an effective online peer review system.

1.2 The peer review process

Improving writing skills takes a long time and a great deal of cognitive energy (Wu et al., 2015). Process writing theory considers writing to be "a dynamic, nonlinear and recursive process of meaning-making and knowledge-transformation that focuses on the activities of the writing process rather than on the finished product" (Yu & Lee, 2016, p.463). As part of this iterative writing process, peer review involves a variety of activities by students who act both as assessor (providing feedback) and as assessee (receiving feedback). Peer review stimulates the learning process of both assessors and assessees as it increases the time spent thinking about, comparing, contrasting, and communicating about a text (Topping, 1998; Lu & Law, 2012; Van Popta et al., 2017). By formulating feedback, assessors learn both to identify problems and to suggest improvements. On the other hand, assessees benefit from the process as they receive feedback and revise their texts accordingly. Furthermore, they write for an audience of multiple fellow students instead of producing a text just for the teacher. This suggests that they take part in a more realistic writing experience (Cho & MacArthur, 2010).

According to Kollar and Fischer (2010), the peer review process consists of three main activities; (a) provision of feedback, (b) feedback reception and (c) revision. The first activity of providing peer feedback is not easy and researchers have observed that constructing feedback that is useful to assessees is a very complex issue (Lu & Law, 2012; Van der Pol, Van den Berg, Admiraal, & Simons, 2008). Especially since the effectiveness of peer review depends partly on the quality and the nature of the comments provided (Van der Pol et al., 2008). Providing good peer feedback requires knowledge and skills to review, clarify, and evaluate other people's work, which is a cognitively demanding task (Lu & Law, 2012; Van Gennip et al., 2010). By its very nature, the act of giving feedback offers students the opportunity to engage in reflective and critical thinking (i.e. deciding what contributes a good piece of work), planning, monitoring and regulation (Rotsaert, Panadero, Schellens, & Raes, 2017). At the same time, assessors might develop a sense of confidence by seeing how their peers are performing, plus they might use peers' work as a source of ideas and vocabulary for their own writing. By focussing on both the form and content of the writing they might start to understand the writing process (Meinecke, 2003). Students learn effectively from reading numerous peers' work and providing feedback, while at the same time their peers' texts offer them insight into what works and what does not work (Tseng & Tsai, 2007).

Secondly, a successful peer feedback process depends on the assessee's reception of the peer comments (Van der Pol et al., 2008). It is hard to predict the way students respond to peer feedback,

since the willingness to follow an assessors' advice also depends on the perceived usefulness and relevance of the feedback (Bangert-Drowns et al., 1991, in Rotsaert et al., 2017) and trustworthiness (Topping, 2010). Before they can act on it, students first need to fully comprehend the problems or suggestions offered so they have to decide which comments are relevant and of high-enough quality. Vagueness has been identified as one of the reasons why feedback would not be processed (Min, 2005). Following up feedback is easier if there is sufficient explanation or suggestion (Lu & Law, 2012). Although researchers agree that the perception of feedback is important (Strijbos et al., 2010), the exact relationship between feedback and the way it is received and accepted is not clear (Van der Pol et al., 2008). Besides, the impact of peer feedback on students' perceived usefulness has hardly been studied (Strijbos et al. 2010). Nevertheless, students in Wu et al.'s study (2015) indicated that they valued the feedback of their peers because it helped them to view their written work as a communicative act with an audience, and to edit it accordingly. It taught them to read their own writing form a reader's perspective, which is very important for effective communication.

The final activity in the peer review process is the actual revision of a text. Revision can be a demanding process as students need to compare the first draft with the given suggestions in the feedback. They have to decide either to act and include a possible improvement (Koller & Fischer, 2010), or not to alter anything (Gielen et al., 2010). In other words, students have to think about the alterations they choose to make, which feedback items to accept and which to decline. This implies that they have to look at their text from multiple perspectives, think about alternative solutions, and consider things they did not notice before (Ge & Er, 2005). Research on students' actual revisions and the effect on writing quality is limited but revision does seem to lead to improved writing performance (Cho & MacArthur, 2010). Students' text revisions can be measured by focussing on the quantity or the quality of the actual revisions. Quantity can be determined by counting the peer comments that are accepted and used for revision. This so-called adoption rate provides an indication of students' willingness to incorporate the given feedback. Several researchers have used the adoption rate but results have been contradictory. Some noted a large percentage of incorporated feedback (Coté, 2014; Min, 2006) whereas others found a much smaller percentage (Liou & Peng, 2009; Paulus, 1999). There is no evidence that the number of revisions correspond with the quality of revision (Min, 2006; Paulus, 1999). The second option is to focus on the quality of revisions, which is in line with Liou and Peng's claim (2009) that not all feedback comments can lead to improved writing. Consequently, actual text revision can be assessed by using the adoption rate or by focussing on the effectiveness of revisions.

Second-language learners can benefit from peer review. Different researchers have observed that second-language learners can give useful comments for successful text revision (Berg, 1999; Coté, 2014; Lu & Bol, 2007; Paulus, 1999; Wu et al., 2015). Like novice writers, second-language

learners tend to give feedback within their ability level (Wu et al., 2015). According to Van Steendam, Rijlaarsdam, Sercu and Van den Berg (2010), second-language writers are often preoccupied with linguistic demands of a text and therefore find it difficult to address the more structural and content problems. Berg's (1999) study found that peer review in a foreign language were able to clarify ideas and improve the theoretical organisation of a text.

The success of peer feedback might be explained by students' knowledge of their peers' comprehension problems as they observe their peers' learning processes from up close and often experience similar problems (Cho & MacArthur, 2010; Dochy, Segers, & Sluijsmans, 2006; Tseng & Tsai, 2007). Compared to expert feedback, peer feedback is often perceived to be more comprehensive since students share the same vocabulary with their peers and do not underestimate the difficulty of the task (Cho & MacArthur, 2010; Koller & Fischer, 2010; Topping, 2010). Although some research has shown that students have more trust in expert reviews than in reviews from peers (Wu et al., 2015), Gielen et al.'s study (2010) showed that students (as opposed to experts) who were given anonymous review, perceived peer and expert feedback as equally helpful. Further, Cho and MacArthur (2010) found that the greatest improvement between drafts and the final version was made by students who received feedback from multiple peers. A simple explanation was that numerous peers may detect and diagnose more problems, pointing out a writer's blind spots and omissions. At the same time, it can balance the uneven quality of peer feedback (Lu & Bol, 2007).

1.3 Types of peer feedback

Feedback messages differ in extent, content and style and various researchers have used different coding systems to categorise different types of feedback comments. Lu and Law (2012, p. 270) posited that "there is little agreement as to which types of feedback are most effective", and indeed literature provides little empirical evidence that link quality criteria of received feedback to performance improvement (Strijbos et al, 2010). Some researchers distinguish between cognitive feedback that targets the content of the work and affective feedback which points out the quality of the work in terms of general praise or criticism (Nelson & Schunn, 2009). Others, such as Liou and Peng (2009) and Min (2005) made a distinction between feedback provided on a global and on a local level. Van Steendam, et al. (2010) used a similar categorisation identifying feedback on higher-order level and lower-order level. They explained that global or higher-order concerns (HOC) affect larger portions of the text such as idea development, audience and purpose, style, organisation and argumentation while local issues or lower-order concerns (LOC) target wording, grammar, spelling or punctuation. Min (2005) concluded that second-language learners need feedback on both local and global level in order to improve their writing skills. This is because, unlike first-language learners, they struggle to organise and express their ideas in English (higher-order) and compose rich sentences (lower-order). Min's

study (2005) also showed that without training in peer feedback, second-language reviewers often focussed on local issues such as spelling and grammar rather than global issues such as structure and content. This was true for provision of feedback as well as for revision. Training such as demonstration and modelling can help students to provide more specific feedback, to identify problems and offer suggestions (Min, 2005). Van Steendam et al. (2010) arrived at similar conclusions claiming that giving feedback on higher-order concerns was not easy and without training most second-language assessors would focus on the surface level of a peer's text.

Other scholars, such as Cho, Schunn and Charney (2006) and Cho and MacArthur (2010), distinguished between directive feedback that contained explicit suggestions or specific changes in a student's written text and non-directive comments that involved more general, nonspecific observations that could apply to any text. Cho et al. (2006) claimed that directive comments might lead to changes in the text, but not to changes in a student's writing behaviour. A possible explanation is that students who receive directive feedback will simply accept the provided suggestions whereas students who receive non-directive feedback have to think about the situation and solve the problems themselves; as a consequence they develop their self-reliance. Subsequently, Cho and MacArthur's (2010) research showed that especially non-directive feedback led to improved writing performance. Complex repairs and extended content revisions were found to be positively associated with non-directive feedback, whereas directive feedback led to simple repair revision (Cho & MacArthur, 2010). Instead of categorizing feedback types, some researchers chose to focus on the types of revisions students made in the review process. Researchers have used a variety of categories for coding revisions, focussing either on the actual revisions (Paulus, 1999; Min, 2006; Van der Pol et al., 2008), on a holistic scoring on the quality of the final drafts (Berg, 1999; Gielen et al, 2010) or on both (Cho & MacArthur, 2010). Cho and MacArthur (2010), for example, used a number of revision categories and found that only the complex repair revisions were linked to writing quality, i.e., students who perform complex revisions based on the given peer feedback eventually produced a better piece of writing.

1.4 Anonymous versus non-anonymous peer review

Peer feedback is an activity in which at least two students share their understanding of a text, therefore it is part of a collaborative learning process (Van der Pol et al., 2008; Van Gennip et al., 2010). Tseng and Tsai (2007) consider an online peer review system to be a small online learning society. Such a student-centred learning experience requires psychological safety, value diversity, and interdependence (Van Gennip et al., 2010). A drawback of peer review can be the undesirable social effects that are inherent to the process. When students trust their peers and believe that the environment is safe for interpersonal risks, they are more likely to regard differences of opinion as a

starting point for learning (Topping, 2010). The interpersonal context in which peer feedback takes place leaves room for peer pressure due to friendship bonds or enmity, and fear of disapproval (Topping, 2010; Vanderhoven, Raes, Montrieux, Rotsaert, & Schellens, 2015). Several studies note that students feel uncomfortable criticising each other's work (Liou & Peng, 2009; Raes, Vanderhoven, & Schellens, 2015; Topping, 2010) while others indicate that students find it extremely difficult to give negative feedback to classmates, especially friends, because they hate to hurt others' feelings or damage personal relationships and often students are just too nice (Lu & Bol, 2007).

Anonymous peer review, in which both assessors and assessees are unknown to each other, is an important tool that can limit the influence of status differences, friendship or retribution (Cho & MacArthur, 2010). Anonymous setting does not disclose the assessor's and assessee's credibility, based on expertise, reliability, intentions towards the receiver, dynamism, and personal attraction (Strijbos et al., 2010). In this way, anonymity mitigates prejudice. For assessors, it can alleviate some of the uneasiness caused by social pressure and the reluctance to criticize others as found in cooperation-oriented cultures (Liou & Peng, 2009). In a study by Vanderhoven et al. (2015), pupils in secondary education felt more positive towards anonymous peer assessment. Similar feelings were expressed by students in higher education on peer assessment who indicated that they felt more comfortable giving feedback anonymously (Raes et al., 2015). Students seem to be more honest and critical, possibly because they feel safer in expressing their opinions, as they do not need to worry about the author's feelings (Lu & Bol, 2007). Liou and Peng's (2009) studies found that students looked forward to the prospect of writing for an unknown audience. Anonymity affected the drafting process as students planned more extensively and wrote more carefully when they were communicating with an audience of unknown peers than when they were evaluated solely by instructors (Lu & Bol, 2007).

During revision, using anonymous peer feedback can solve the problem of students mistrusting weaker students' comments (Paulus, 1999). Many students hesitate to accept peers' feedback when they know their peers are less capable writers than themselves, even if the comments are correct (Lu & Bol, 2007). One of the aspects that affects students uptake of feedback is the trust in their peers' ability as assessor (Van Gennip et al., 2010). Liou and Peng's empirical work (2009) evidenced that students who did not trust the effectiveness of peer review but who adopted the feedback anyway, did successfully revise their writings and ended up submitting texts of better quality. An anonymous distribution might provide a sufficient degree of uncertainty regarding the peer's status, age, past grades, gender and language proficiency (Johnson, 2001). It might induce a mindful and critical acceptance of the received peer comments that asks for a deeper thinking before accepting or rejecting the feedback (Gielen et al., 2010; Huisman, Saab, Van Driel, Van den Broek, 2017). In a study on college writing (first language), Lu and Bol (2007) found notably higher post-test scores on writing

performance in the anonymous condition than in the non-anonymous condition. Similar findings were published by Guilford (2001) whose students claimed that the quality of their term papers and their course grades improved after using anonymous peer review during the writing process.

1.5 Research questions and hypotheses

Building on previous research, this study focusses on the possible variables that can affect the effectiveness of the online peer review process in second-language writing assignments. Using a quasi-experimental design with two conditions: anonymous and non-anonymous, this study examines the effect of anonymous and non-anonymous peer feedback on the online peer review process on Dutch university students. More specifically, this empirical work investigates the impact of anonymity on the different types of online peer feedback, on students' revisions and on their writing performance (see figure 1) with the overarching research aim to improve the facilitation of the online peer review process. The main research question is: what is the effect of anonymity on different types of peer feedback (higher-order and lower-order feedback / directive, non-directive), revisions and performance in the peer review process? This question will be answered by examining sub questions and hypotheses:

RQ1: As students in the anonymous group feel less restricted by peer pressure, chances are that they feel free to express themselves more critically and suggest more substantial changes. Hence, the first research question is: What is the effect of anonymous and non-anonymous online peer review on the types of feedback students offer?

H1: Anonymous assessors offer more feedback on higher-order concerns than assessors in the non-anonymous condition.

H2: Assessors in the anonymous condition provide more feedback and more different types of the feedback (directive higher-order and lower-order concerns and non-directive higher- and lower-order concerns) than the non-anonymous assessors.

RQ2: What is the effect of anonymity and non-anonymity and feedback types on the revision of the feedback items?

H3: Students in the anonymous condition process more feedback items than their peers in the non-anonymous condition, in other words, they show a higher adoption rate.

H4: Feedback on directive, lower-order concerns is more likely to be processed than feedback on non-directive, higher-order concerns.

H5: Students in the anonymous condition process more feedback on higher-order concerns than students in the non-anonymous condition.

RQ3: What is the effect of anonymous and non-anonymous online peer feedback and revisions on writing performance?

H6: Akin to research by Lu and Bol (2007), students in the anonymous condition score higher grades than students in the non-anonymous condition.

H7: The combined effect of revision of feedback and anonymity leads to higher final grades.

H8: The effect of the anonymous and non-anonymous condition on the final grades is modified by the assessee's trust in the assessor.

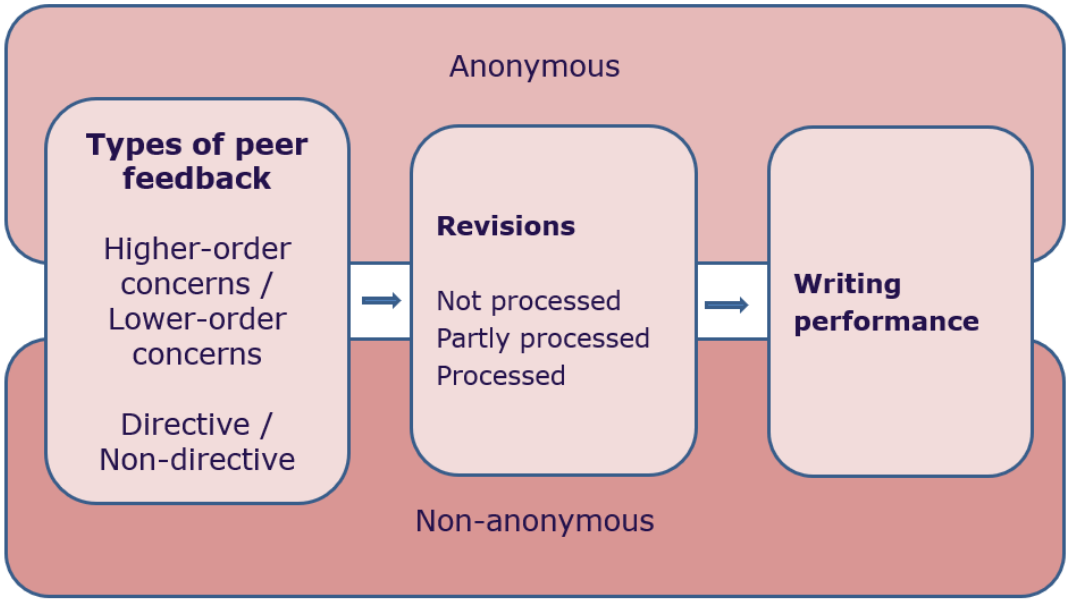

Figure 1. Conceptual research diagram

2. Method

2.1 Design

To investigate the effect of anonymous and non-anonymous peer feedback on the peer review process, this study used a quasi-experimental design. All students followed an 8-week course called English Writing Power 2 in which they participated as assessors and assessees. Classes, materials and teacher support were also similar for both experimental conditions. Students were familiar with peer review in English writing as they had given peer feedback in a previous writing course, but not with providing or receiving anonymous peer feedback nor with an online peer feedback programme. The online programme used in this course was called Peergrade.io, provided by a Danish company and available online. It offered the possibility for all students to follow exactly the same online procedures. The only

difference was that students in the anonymous condition saw “submission 1” and ‘submission 2”, whereas their peers in the non-anonymous condition saw their peers’ names (example of an anonymous screenshot can be found in appendix A). None of the students had used Peergrade.io before the start of the course. In the anonymous peer feedback setting, assessors as well as assessees were anonymous and therefore unknown to each other. Their essays were distributed anonymously and randomly among 63 students of five different groups. In the non-anonymous setting, all assessors and assessees were identified by name. The essays were reviewed by students from their own group (circa 10-15 per group, a total of 53) who knew each other personally as they had been working together intensively in a number of courses since the start of the academic year.

2.2 Participants

In the spring of 2018, all 124 second-year students, age 18 to 24 years (average age 21), of Commerce and Marketing at the University of Applied Sciences in Leiden, the Netherlands, were invited to participate in this study. At the start of the academic year, students were randomly divided over five different classes by the university administration. Subsequently, each class was split into two groups by administration (group A and B) for a number of different courses, including the English module in which the research took place. In the end, ten groups of 11 to 15 students took part in the research. All A groups were assigned to the non-anonymous setting, whereas all B groups made up the anonymous condition. Participation was part of the curriculum and no financial compensation was offered. Similar to previous English courses, attendance was mandatory for 6 out of 7 classes in order for students to be allowed to take the exam. All students were native speakers of Dutch, there were no bilingual students with English as a mother tongue. All students had acquired more or less B2 level (upper-intermediate) in English and there were no level groups.

In the end, 114 students offered feedback to peers (assessors), while 100 students revised their essays based on the feedback they received (assessees), see Table 1 for more details. There were several reasons why students were excluded from research. To start with, some students only participated in part of the peer feedback process; a number of students had uploaded their essays but were absent in week 7, therefore they did receive feedback but did not act as assessor. Some students did offer feedback in class but had not uploaded their essay before the deadline, hence they did not receive feedback. In addition, a number of students uploaded a first draft that was too short (250 words or less instead of 500) or contained too few paragraphs (two or three instead of five). Although these students were allowed to take part in the peer feedback process as assessor and to use the feedback they received to improve their final drafts, their essays were removed from the research since it needed too much revision to start with and this would compromise the data (anonymous: 5, non-anonymous:13). Finally, one assessee in the anonymous condition was excluded from research

because he wrote his name on the essay. All of this affected the number of participants. In the end, the anonymous condition comprised 102 dyads (one assessor linked to one assessee) and the non-anonymous setting comprised 87 dyads.

Table 1

Participants: Assessors and Assessees in the two Experimental Conditions

	Assessors			***Assessees***		
	Anonymous condition	Non-anonymous condition	Total	Anonymous condition	Non-anonymous Condition	Total
Male	41	38	79	32	35	67
Female	22	13	35	21	12	33
	N=63	N=51	N=114	N=53	N=47	N=100

The course was taught by two teachers, including the researcher. One teacher taught four groups (2 anonymous, 2 non-anonymous), the other taught six groups (3 anonymous, 3 non-anonymous). Both teachers had a Master's degree in English language and culture, similar work experience and both had taught the course Writing Power in previous years. Grading was done by both teachers for their own respective groups.

2.3 Materials

The online peer review process offered information on the provision, reception and revision of peer feedback comments. To start with, Peergrad.io provided the option to download all first drafts and final drafts of the essays that students had uploaded. Besides, Peergrade.io also provided each experimental group an overview of the peer feedback comments. All feedback items were categorised in terms of types of feedback and checked for revision. Subsequently, students' final grades for the writing module offered insight into students' writing performance. School administration supplied the final grades for the course, plus grades on a previous English writing course (November 2017). Information on both the assessors and assessees, such as gender, date of birth, the condition (anonymous / non-anonymous), teacher and students' indication of trust in the assessor was collected and combined, see Table 2 for more information on the independent and dependent variables as well as the respective scales of measurement.

Table 2

Overview of the Independent and Dependent Variables and Scales of Measurement

Variables	Values / Scales & subscales	Abbreviation
Anonymous setting	-	Anonymous
Non-anonymous setting		Non-anonymous
Type of feedback		
	Directive + Lower-order-concerns	D_LOC
	Non-directive + Lower-order concerns	ND_LOC
	Directive + Higher-order-concerns	D_HOC
	Non-directive + Higher-order concerns	ND_HOC
Revisions		
	Processed	Processed
	Not processed	Not processed
	Partly processed	Partly processed
Writing performance		
Pretest	1-2-3-4-5-6-7-8-9-10	PretestAssessee
Final grades	1-2-3-4-5-6-7-8-9-10	PosttestAssessee
Student's perception		
Trust in assessor	1-2-3-4-5-6 / no answer	Trust

2.4 Procedure

The 8-week course called Writing Power 2 started in the week of February the 5th 2018. All students followed the same weekly face-to-face classes of circa one hour, providing the same programme and in-class activities. Since attendance was mandatory for six out of seven classes, every week only a small number of students was absent. In the first four weeks, students were trained in writing, argumentation and peer review. The benefits of peer review were explained at the beginning of the course. The differences between directive and non-directive feedback and higher-order and lower-order feedback were explained by the teacher. For writing practice, students wrote a number of short texts and a group essay. To practice the peer feedback process, students gave each other feedback on the group essays and on the frameworks of their first essays. Weeks five to eight were used to write two five-paragraph argumentative essays of circa 500 words on ethical business cases. Both essays were part of the test as essay 1 counted for 40% of the final grade and essay 2 counted for 60% (see appendix B for the key). The exam and assessment rubrics were similar for all students. Only the first essay was used for research on online peer review.

The assignment for essay 1 was to write a five-paragraph essay on an ethical business case that students could choose from the website cases.ethicsworkshop.org. Students received the details of the assignment in week 4, discussed it in class and after a short demonstration of the online programme

Peergrade.io, they uploaded a framework of their text containing a thesis statement and three arguments to Peergrade.io. In week 6 they gave each other online peer feedback on the frameworks of essay 1 in class and as a benefit they got more familiar with the online programme. Using the feedback they received on the framework, they wrote the first draft of the essay (circa 500 words) and uploaded their text to Peergrade.io at the start of week 7. All students were automatically assigned either to the anonymous condition or the non-anonymous condition. In week 7 students participated in the actual peer review process by providing online peer feedback to two peers. This took place in class while the teacher was available for practical questions on the assignment and on the use of the programme. It was scheduled for about one hour and that was sufficient for all students. The majority of students gave peer feedback on two texts, and consequently most students received feedback from two fellow students. After class, students received a notification from the programme that they could view the given comments, they could access the feedback online and use it for revision. Students revised their texts after class, as a take-home assignment. Both in class and at home students had access to (online) articles on the subject, dictionaries, thesaurus, etc. In week 8 all students uploaded their final drafts. To encourage students to participate in the peer review process, the final grade for the module was partly based on the peer feedback they gave (20% of their final grade). Both essay 1 and essay 2, plus a signature and a declaration of originality, were handed in and uploaded to a programme that checks for plagiarism.

The provision of peer review in class ran quite smoothly. Although most students had been unfamiliar with Peergrade.io, this did not lead to any problems. The programme was user friendly and most students were computer savvy. Instruction as well as students' feedback comments were in Dutch. At the top of the feedback page instruction read: "Please give feedback on the essay: thesis and arguments, structure and layout, linking words, grammar and spelling, choice of words, etc." (translated from the original language used: see Appendix A). This was added to guide students towards more balanced feedback (Gielen & De Wever, 2015; Rotsaert et al., 2017). Students were encouraged to remark upon any irregularities in the essays, including items they did not understand. In case they could not think of any changes that should be made in the essay, they were told to point out what worked well (positive feedback). The programme offered six windows in which they could type peer feedback. All feedback was one way, as there was no option for online interactivity between students. One week later in class, students were given an online questionnaire where they had to respond to several Likert scale items on the measure of trust they put in the assessor. Table 3 offers an overview of the learning phases in the writing course.

Table 3

Overview of Learning Phases in the two Experimental Conditions

Lesson Phases	Anonymous setting	Non-anonymous setting
Week 1 – 4: classes on writing, (ethical) argumentation and training in peer review. Students wrote a group essays. (Week 5: no class)	4 x 1 hour	4 x 1 hour
Week 6: In class: students gave online peer feedback on frameworks essay 1	1 hour	1 hour
Week 7: In class: students gave online feedback on first drafts essay 1	1 hour	1 hour
Week 8: students scored the feedback they received + revision. Students uploaded the final draft of essay 1	1 hour	1 hour
Week 9: Students wrote essay 2 (take-home assignment)	8 hours	8 hours
Total Duration	7 hours class 8 hours test	7 hours class 8 hours test

2.5 Data-analyses

All data was combined and collected in Excel and the entire corpus was used for analyses. Using Chi's verbal analysis model (1997), all feedback was segmented based on semantic features; every chunk of feedback addressing one topic or idea was considered a comment, one unit of analysis. For example, if students offered feedback combining a number of different topics, these were segmented into singular units for analysis based on one topic/ idea. An example of a cluster of feedback statements that were segmented into singular units is presented in Table 4. Eventually 1490 unique peer review items were identified: 835 anonymous and 655 non-anonymous feedback comments.

Table 4

Strings of Feedback Split up into Individual Feedback Items

Example in English (translated)	Original example: splitting up feedback items
Paragraph 2: Your First argument is good only I will formulate 'can give it' differently // I would place a comma for especially because it refers to the previous sentence // Coca Cola has to be written with capitals;) // In the last sentence I would not use the word demage because their way of looking at Coca Cola is not damaged but changed negatively.	"*Alinea 2: Je eerste argument is goed alleen ik zal zelf 'can give it' anders formuleren // Ik zou voor especially een komma zetten aangezien die zin over de zin daar voor gaat. // Coca Cola moet met hoofdletters;)// Ik zou in de laatste zin niet het woord demage gebruiken aangezien hun manier van kijken naar Coca Cola niet wordt beschadigd maar wel negatief veranderd."*

For the next step of labelling the feedback items, a coding scheme was developed which categorised the feedback items into different types. First of all, it filtered all feedback items that indicated a possible change (Action) or correction to improve the text, in other words, the revision-oriented comments. This is in line with Parr and Timperley (2010) who indicated that only feedback items that suggest alterations could be followed up. Items that did not contain error correction were recognised and labelled but not used for further research (275 feedback items in total). These items consisted of positive feedback such as compliments (e.g. "good thesis and explanation."), and remarks that did not point out any changes (e.g. "I am not very good in grammar myself, so I did not look into that"). Although feedback in the form of praise, criticism or summary have in some cases been found to help a student's writing process (Cho et al., 2006), they rarely occurred to be influential in other research experiments (Cho & MacArthur, 2010) and they play no role in this study. In some cases (27 of 1490) assessors repeated the same comment twice, in which cases the second comment was labelled (H) and not used for analyses. On top of that, some assessees handed in an essay that was slightly incomplete. If feedback indicated that a title or a complete paragraph was missing, the comment was labelled (R) and not used for analyses (87 feedback items). This was based on the idea that assessees would add the missing parts before handing in the final version with or without feedback indication.

After that, the remaining 1103 feedback comments were categorised using the codes higher-order concerns (HOC) and lower order concerns (LOC) and directive (D) and non-directive (ND). Lower-order concerns involved spelling, grammar, targets wording and punctuation. Higher-order concerns included development of ideas, audience and purpose, style, organisation and argumentation (Liou & Peng, 2009; Van Steendam et al., 2010). In line with research by Cho and MacArthur (2010) directive feedback pointed out explicit suggestions or specific changes in a student's written text. In other words, directive feedback items indicated a problem plus offered a solution. Non-directive feedback

on the other hand, involved observations and comments without suggesting any specific changes, leaving it to the students to self-correct them. The directive, non-directive, higher-order and lower order concerns made up four categories on a nominal scale. For details on the combinations of these feedback types see Table 5.

Table 5

Description of four Types of Peer Review

Categories		**Directive**	**Non-directive**
	Description	D: Explicit suggestions or specific changes in a students' written text	ND: Nonspecific observations, including all comments on details without suggesting a specific adjustment.
Higher-order concerns	HOC: Development of ideas, audience and purpose, style, organisation and argumentation	Example D_HOC: "For more structure in the text, I would use firstly, secondly... etc." *(Translation: "Voor de structuur in je tekst zou ik argumenten inzetten met firstly, secondly...etc.)*	Example ND_HOC: "The second argument does not agree with the thesis statement." *(Translation: "Het tweede argument sluit niet aan op je thesis statement,")*
Lower-order concerns	LOC: Spelling, grammar, targets wording, lay-out and punctuation	Example D_LOC: "Besides, it sounds better if you use Persons instead of People. *(Translation:"Daarnast klinkt het beter als je Persons vervangt door People.")*	Example ND_LOC: "But then is informal language so change that. *(Translation: "But then is een spreektaal, dus pas dat aan.")*

To determine if the coding by the researcher was done correctly, a second rater was asked to label part of the feedback items (FBAction and FBTypes). Cohen's κ was run on this sample of 12,2% of the feedback items to determine if there was inter-rater agreement. There was an almost perfect agreement on revision-oriented feedback: FBAction $\kappa = .981$ (12,2%), $p < .0005$ and a substantial agreement on the four types of feedback: FBType $\kappa = .78$ (9,1%) $p < .0005$.

Revisions was measured on an ordinal scale of three categories: processed, partly processed and not processed, which is a simplification of Cho and MacArthurs's scheme (2010). Students' first drafts were compared to their final drafts using 'compare documents' in Word. The researcher indicated for all 1103 comments whether or not it was used for revision; more than half of the

feedback items was processed (55,8%), about one third was not processed (34,0%) and just over 10 percent (10,2%) was partially processed. See Table 6 for a more detailed description.

Table 6

Description of Quality of Revisions

Categories	Descriptor
Not processed	The final draft did not show any sign of change that could be linked to the specific peer feedback comment
Partly processed	The final draft showed some signs of changes, however, the problem indicated by the specific feedback item was not solved
Processed	The final draft showed clear signs of a change related to the specific peer feedback item

The final grades for the writing module offered insight into students' writing performance. Variables that were used to control for other influences included a pretest on the assessees' writing performance and the assessees' trust in the assessors. As a pretest on writing performance, the researcher looked at students' grades for an English writing test taken in November 2017 called Writing Power 1, a course taken by the same cohort of students and taught by the same teachers. Students wrote three informative articles in English. The test was a 500 word informative text on the subject 'international business / international career', using formal language and a logical structure. Peer feedback was part of the writing process but it took place in class and not in an online programme. The key for this test can be found in appendix C (scale 1 to 10). The course was part of the curriculum and all but five students took the exam. Another covariate was trustworthiness of the assessor, which was rated on a 6-point Likert Scale (1=not trustworthy, 6=very trustworthy). However, as not all students answered the question on trustworthiness, the information was only available for 80 out of 189 dyads.

Using a pivot table in Excel, the data was made available both on feedback item level and on dyad level. This gave the researcher the possibility to run some of the analyses on dyad level, without having to adjust for the over- or underrepresentation of information from dyads with particularly large or small numbers of feedback items. Both data files were transferred to SPSS for analyses; the file on dyad level was used for hypothesis 1, 6 and 8.

3. Results

The online peer review process of 189 dyads was used for analyses. All the 1103 revision-oriented feedback items were coded: 620 anonymous and 483 non-anonymous. The mean number of revision-oriented feedback items (FBAction) was just short of six (M = 5.84, SD = 3.601); in the anonymous condition M = 6.08, SD = 3.74 per dyad, and in the non-anonymous condition M = 5.55, SD = 3.43 per dyad (this difference is not significant as $t(187) = -1.00$, $p = > .05$ (two-tailed)).

3.1 Anonymity and feedback types

The first research question focused on the effect of anonymous and non-anonymous online peer review on the types of feedback students offered. The first hypothesis claimed that students in the anonymous setting might feel less restricted by peer pressure, therefore they would express themselves more freely, be more critical and would not hesitate to indicate substantial changes. As a consequence they would offer more feedback concerning higher-order changes than students in the non-anonymous setting. To start with, description displayed that the average number of feedback on lower-order concerns (M = 3.63, SD = 2.85) for all 189 assessors in this study was higher than the average number of higher-order concerns (M = 3.10, SD = 1.90). An independent t-test revealed significant difference between the number of higher-order concerns pointed out by students in the anonymous condition (M = 3.37, SD = 1.76) and students in the non-anonymous condition (M = 2.79, SD = 2.02) as $t(164) = -1.97$, $p < .05$ (one-tailed). Hence, the first hypothesis was accepted.

Hypothesis two predicted that anonymous assessors would offer different quantities of the four feedback types (D_LOC, D_HOC, ND_LOC, ND_HOC) than the non-anonymous assessors. Chi square analysis indicated a significant association between experimental conditions and the four combined types of feedback; chi-square χ^2 (3, N = 1103) = 11.93, p = .01, see figure 2. Hence, hypothesis two was accepted.

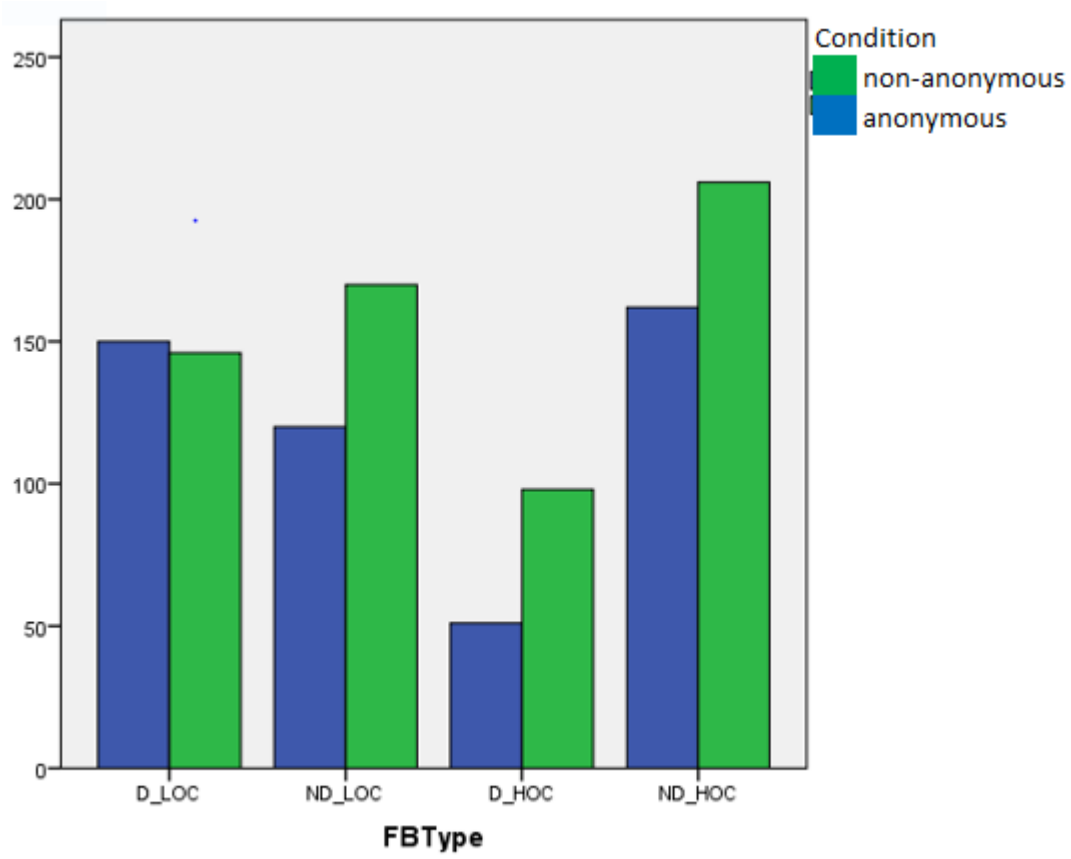

Figure 2. Types of feedback, offered by students in the anonymous and non-anonymous condition

Note: D_LOC = Directive Lower-Order Concern; ND_LOC =Non-directive Lower-Order Concern; D_HOC = Directive Higher-Order Concern; ND_HOC = Non Directive Higher-Order Concern.

3.2 Anonymity and revision

The second research question focussed on the effect of anonymity and feedback types (LOC/HOC, D/ND) on revision (processed, partly processed, not processed). Hypothesis three stated that assessees in the anonymous condition might focus on the actual comments instead of the person giving the feedback, they would not be influenced by the assessor's status. Therefore students in the anonymous condition would be more likely to process feedback items than their peers in the non-anonymous condition. In other words, the adoption rate would be higher for anonymous assessees. However, chi-square test indicated that there was no statistically significant association between the experimental conditions and revision, χ^2 (2, N = 1103) = 0.70, p = .71. Assessees in the anonymous condition did not process more feedback than students in the non-anonymous condition and hypothesis three was rejected.

The fourth hypothesis, stated that directive lower-order feedback (D_LOC) was easier to revise than the other feedback types and as a consequence it would be revised more often than non-directive higher-order feedback (ND_HOC) which was considered most complex to process. Indeed, chi-square indicated a significant association between the four combined types of feedback and revision χ^2 (6, N = 1103) = 118.97, p = .00. It was concluded that a higher proportion of directive lower-order concerns was processed (D_LOC: 235/296) than directive higher-order concerns D_HOC: (88/148). Non-directive lower-order feedback and non-directive higher-order feedback were processed in more or less equal proportion (ND_LOC: 128/292; ND_HOC: 165/367). Considering the feedback items that were not processed, the lowest proportion was found among the directive lower-order feedback concerns (D_LOC: 55/296) and the highest proportion of unprocessed feedback items was recognised in the non-directive feedback on higher-order concerns (ND_HOC:160/367). This indicated that non-directive higher-order concerns (ND_HOC) were less likely to be processed than directive lower-order concerns (D_LOC), (see figure 3). Multinomial logistic regression was run to see if prediction of revision was possible. This also revealed a significant chi-square χ^2 (6, N = 1103) = 124.87, p = .00. The parameter estimates for processed feedback indicated that the odds that directive, lower-order feedback (D_LOC) feedback would be processed compared to not processed was bigger than for non-directive, higher-order concerns (ND_HOC), b = 1,412, Wald χ^2 (1, N = 1103) = 57.99, p = .00. Consequently, the fourth hypothesis predicting directive lower-order feedback (D_LOC) would be revised more often than non-directive higher-order feedback (ND_HOC), was accepted.

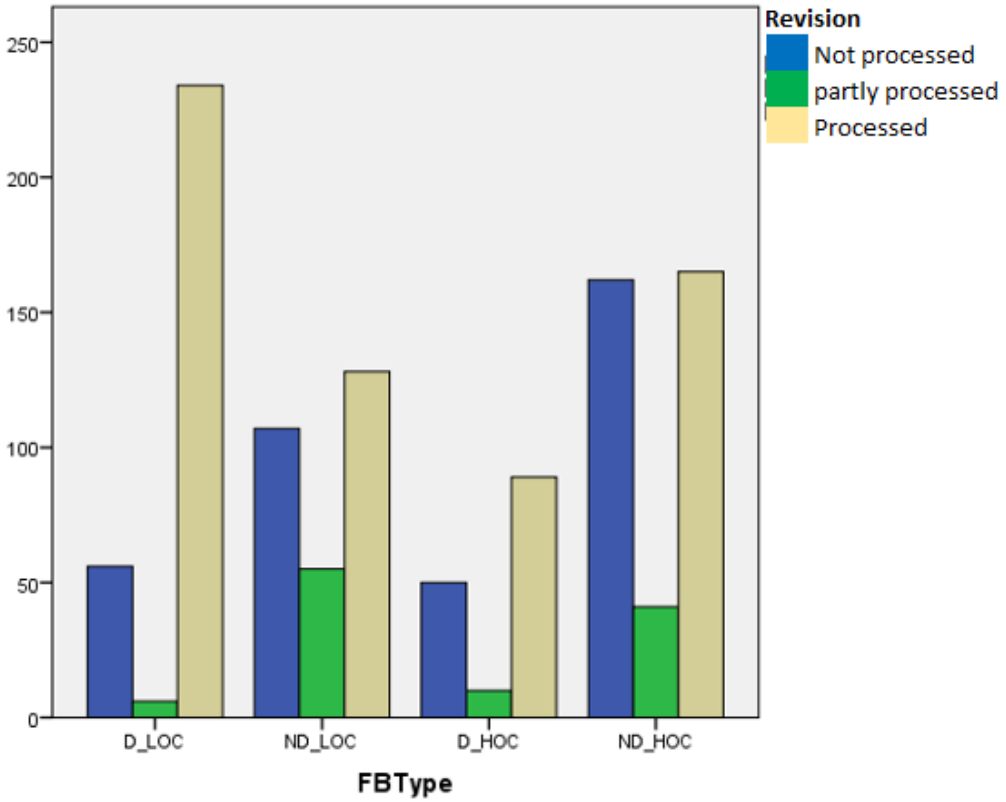

Figure 3. Revision of different types of feedback

Note: D_LOC = Directive Lower-Order Concern; ND_LOC =Non-directive Lower-Order Concern; D_HOC = Directive Higher-Order Concern; ND_HOC = Non Directive Higher-Order Concern.

Hypothesis five stated that students in the anonymous condition would process more feedback on higher-order concerns than students in the non-anonymous condition. This was based on the idea that students in the anonymous condition would put more effort in examining the actual comments before deciding whether and how to use the feedback for revision. In other words, anonymity could induce mindful and critical thinking which could have a positive effect on the way they viewed the comments on higher-order concerns. First of all, multinomial logistic regression showed that the combination of feedback types and experimental conditions (anonymous/non-anonymous) explained a significant amount of the variation in revision as Pearson's chi-square was significant $\chi^2(14, N = 1103) = 137.88$, $p = .00$. However, hypothesis five focussed on the feedback that was processed. Accordingly, students from both experimental conditions who received directive, lower-order feedback (D_LOC) were predicted to process the feedback: anonymous b= 1,064 Wald χ^2 (1) = 19.62, $p = .00$, non-anonymous b = 1,816 Wald χ^2 (1) = 39.94, $p = .00$. Moreover, the anonymous condition

combined with directive higher-order feedback (D_HOC) predicted whether the feedback items were processed b = ,551 Wald $\chi^2(1) = 4.33$, p = .04. Other combinations were not significant. To conclude, the interaction between the types of feedback (D_LOC, D_HOC) and the two experimental condition predicted the revision of feedback, it explained circa 12-14% of variance (Cox and Snell = .118; Nagelkerke = .139). Hypothesis five was accepted because directive, higher-order feedback (D_HOC) could be predicted to be processed only by assessees in the anonymous condition.

3.3 Anonymity and writing performance

The third research question addressed the effect of anonymous and non-anonymous online peer feedback on writing performance. The sixth hypothesis was in line with research by Lu and Bol (2007) in whose study students in the anonymous condition demonstrated significantly better writing performance. Hypothesis six forecasted that students in the anonymous condition would score higher grades than students in the non-anonymous condition. An independent t-test showed that students in the anonymous condition received significantly higher grades for the writing module (M = 7.43, SD = 1.12) than students in the non-anonymous condition (M = 6.94, SD = 1.03), $t(187) = -3.10$, $p < .001$ (one-tailed). Such a significant difference was not found in the pretest: $t(177) = -1.18$, $p > .05$ (one-tailed). Thus, in this study, students in the anonymous condition scored significantly higher final grades for the writing module, which results in the acceptance of hypothesis six.

Hypothesis seven claimed that final scores were affected by the two experimental conditions (anonymous/non-anonymous) and revision of feedback. A multiple regression analysis was run to predict final grades from the experimental condition and revision. Both these variables statistically significantly predicted writing scores, $F(2,1100) = 42.49$, p = .00, R^2 = .072, , p = .00. This analyses was possible because revision of feedback was found to be relatively equal for both experimental conditions (see hypothesis three). Hypothesis seven was accepted, as condition (anonymous/non-anonymous) and revision of feedback explained circa 7,2% of the variance of the final grades.

The eighth and last hypothesis looked at effect of the anonymous and non-anonymous condition on the final grades and possible modification by the assessee's trust in the assessor. Using trust in the assessor as the covariate, a one-way analysis of covariance (ANCOVA) was performed to assess differences in the final writing scores between the anonymous and the non-anonymous group. Results indicated first of all that trust in the assessor significantly predicted writing scores $F(1,77) = 4.00$, p = ,49. On top of that, the combined effect of the experimental conditions and trustworthiness of the assessor on final grades was significant, $F(1,77) = 6.12$, p = .02 and it explained circa 11% (R^2= ,109) of the variance of the final grades. The variable measuring students' trust in the assessor could be used as covariates since a t-test did not show significant differences between both conditions

(anonymous/non-anonymous) and trust in the assessor: $t(78) = .66$, $p > .05$. This led to the acceptance of hypothesis eight.

4. Conclusion and Discussion

4.1 Conclusion

This study focussed on the effect of anonymity on different types of peer feedback, revisions and performance in the online peer review process in a second-language writing course. 114 Dutch students of the University of Applied Sciences in Leiden participated and offered feedback to their peers on English essays. It was hypothesised that an anonymous and non-anonymous condition would affect the types of feedback, revisions and final grades.

The first research question looked at the effect of anonymity on the types of feedback students offered. Since lower-order feedback is considered 'easier' to offer and 'easier' to revise, it is interesting to see that the anonymous assessors provided significantly more feedback on higher-order concerns such as idea development and organisation than their non-anonymous peers. Students in the anonymous condition also provided significantly different quantities of the feedback types; offering more feedback on non-directive lower-order and higher-order concerns and directive higher-order concerns, (ND_LOC, D_HOC and ND_HOC), but slightly less on directive lower-order concerns (D_LOC) than the non-anonymous students. Research findings support the theory that anonymous online peer review invites more critical peer feedback.

The second research question focussed on the effect of anonymity and non-anonymity and feedback types on revision of the feedback items. Analysis showed that anonymous assessees did not process more feedback than their non-identified peers and therefore the adoption rate for both experimental conditions was equal. After establishing that in general different types of feedback were differently processed, it became clear that revision of feedback could be predicted for directive, lower-order feedback (D_LOC) in both the anonymous and non-anonymous condition, and for directive, higher-order feedback (D_HOC) by assessors in the anonymous condition. Thus, in this study, both provision and revision of feedback on higher-order concerns was affected by anonymity. This seems promising since different researchers have shown interest in how to stimulate second-language students to provide feedback on global, higher-order level rather than on the 'easier' local or lower-order concerns (Min, 2006; Van Steendam et al., 2010).

The third research question considered the effect of anonymous and non-anonymous online peer feedback and revisions on students' writing performance. Like in research by Lu and Bol (2007), students in the anonymous condition scored higher final grades than students in the non-anonymous condition. There was a small but significant prediction of writing scores from condition (anonymous /

non-anonymous) and revision (not processed / partly processed / processed). On top of that, the relationship between the anonymous and non-anonymous condition and final grades was modified by the assessee's trust in the assessor which accounted for circa 11% of variability of the final grades. These effects are significant but small. To conclude, like in research by Guildford (2001) and Lu and Bol (2007) this study showed higher final scores for students in the anonymous condition, which strengthens the belief that anonymous peer review might be related to improved writing skills.

To answer the main research question, anonymity did indeed affect the types of feedback given by students, it affected students' revisions and their final grades in second-language writing. Anonymity can therefore be considered an interesting tool in the online peer review process of second-language writing courses.

This study did have a number of limitations. First of all, the participants were predominantly male which makes extrapolation of the results to other groups of students more difficult. Besides, participants were all Dutch students of Commerce and Marketing. According to Rienties, Luchoomun and Tempelaar (2014) Dutch students seem to do well in student-centred educational settings in which Hofstede's cultural dimensions of low power-distance, weak uncertainty avoidance and femininity are the norm. This implies that Dutch students are used to be treated as equals, to have their opinions taken seriously, and would rather care for their peers than strive for the highest marks, all of which are important elements in the peer review process. These insights suggest that anonymity could have a different effect on the peer review process of students from other cultures and other faculties.

4.2 Suggestions for future research

The results of the study raised numerous new interesting research questions. First of all, this study into online peer review could be replicated among students of different cultures and faculties; it might be possible that the results in masculine cultures that score high in power-distance and uncertainty avoidance show different outcomes. A qualitative study into the effects of anonymity might lead to a more in-depth understanding of the effect of anonymity on students in the different steps of the peer review process.

Besides, it would be interesting to look more closely at the influence of variables such as high and low performing students on the peer review process of second-language writers. In a study among first-language learners in secondary education, Gielen et al. (2010) found different effects of peer feedback on writing performances for students who scored high and low on a pretest, while Strijbos et al. (2010) found that feedback by high competence peers led to different perception than feedback by low competence peers. These variables might moderate some of the relationships and effects found in

this study. Another variable that might be looked at more closely is students' perception and the way feedback, and the different types of feedback, are received by students in both experimental conditions.

Another point of interest is the effect on the long term writing performance. Cho et al. (2006) claimed that directive comments may lead to changes in the text, but not to changes in a student's writing behaviour. This is because students receiving directive feedback will simply follow the provided suggestions whereas students receiving feedback in a non-directive way have to think about the situation and solve the problems themselves.

This study also raises the question whether anonymity has more effect on assessees or on assessors. The focus of the present research questions was on anonymity in the peer review process and specifically on the impact it had on assessees. This could be an issue of interest, as anonymity might affect the quality of the first draft. This would be in line with Lu and Bol's claim (2007) that students plan more extensively and write more carefully when they are communicating with an audience of unknown peers than when they are evaluated solely by instructors. Besides, the assessors might have gained new insights by looking at their peers' texts plus giving feedback, especially if they transferred that new knowledge to their own texts as was the claim by Lundstrom & Baker (2009). On top of that, it has been observed that students who give plenty and high quality feedback are likely to be more critical of their own work (Gielen et al., 2010; Kerr & Park, 1995; Lu & Bol, 2007; Lu & Law, 2012; Lundstrom & Baker, 2009; Meinecke, 2003). By transferring their knowledge to their own writing, they improve their texts both on the local and global level (Lundstrom & Baker, 2009). The effect of anonymity on assessors might play a role in the difference in final grades between students who gave and received feedback anonymously and their peers in the non-anonymous group.

4.3 Scientific significance

Although peer review often seems to be associated with better student achievement (Lu & Bol, 2007), it does not automatically lead to positive outcomes (Shute, 2008; Rotsaert et al., 2017). Within the research framework on peer review process, different researchers have examined the impact of different variables in a number of combinations. For example, studies by Min (2005) and Van Steendam et al. (2010) showed that training in the peer review process was beneficial as it affected both students' reviewing skills and their writing skills. In addition, Cho and MacArthur found that receiving feedback from multiple peers improved students' writing quality. Furthermore, positive effects have also been found for the use of computer-mediated technology in the peer review process (Liou & Peng, 2009).

Unlike an in-class peer review process, online peer review offers the opportunity to use anonymity, which has been found to reduce the perception of peer pressure and increase the feeling of

comfort in peer assessment (Raes et al., 2015). Investigating the effect of anonymous and non-anonymous peer review in second-language writing education provided new insights into the peer review process. Anonymity affected the types of feedback given by students in this study as it led to more feedback on higher-order concerns. On top of that, revision was predicted for directive feedback on both higher- and lower-order concerns for students in the anonymous condition. Furthermore, students in the anonymous condition showed significantly higher final grades, which is in line with findings by Lu and Bol (2007). The research results of the present study might inspire other researchers to pursue empirical research on the effect of anonymity on the online peer review process. Research on the effect of anonymous peer feedback on writing is scarce, especially in second-language learning, which raises the status of anonymity as an emerging topic of interest in educational research (Lu & Bol, 2007). For example, in this study the effect of the anonymous and non-anonymous condition on the final grades is still for a rather large percentage of variance unaccounted for. Hopefully, in due time research can help to identify the main determinants. As soon as that is accomplished, it should become easier for teachers to facilitate an online peer review process that can optimize the successful uptake of peer review comments and therefore bring about the desired learning outcomes.

4.4 Practical significance

While peer review is common practice in second-language writing assignments and is thought to incur a learning effect, there is no clear sense of good practice with online peer review. Evidence-based, instructional writing strategies are important for language teachers, as it might help them to overcome the feeling of discomfort and unpreparedness to teach writing (Graham & Hebert, 2010; Graham et al., 2013). This study might add to the design of an online peer review process that ultimately leads to better writing performance. Online peer review easily fits in the shift of focus from the final writing product to the writing process in which students learn to plan and revise their texts by constant re-reading and rearranging, while producing multiple drafts. In addition the online peer review offers students the opportunity to participate in collaborative learning in which students learn from each other and not just from the teacher. A good online peer review system might save staff time by reducing teachers' workload (Cho & MacArthur, 2010; Topping, 2010) while the timing, frequency, extend and speed of feedback may be increased (Gielen et al., 2010; Lu & Law, 2012).

Both students and teachers have become more familiar using online technology in their every-day lives and blended learning has found its way into many classrooms. Although it has been relatively easy for an instructor to create an online environment in which students give each other either anonymous or non-anonymous peer feedback on writing, the pros and cons of these two possibilities were unexplored. Empirical research on the impact of instructional interventions, different

conditions and circumstances of online peer feedback on learning was limited (Van Popta et al., 2017). On top of that, there was little agreement as to which types of feedback were most effective (Lu & Law, 2012). The insight that anonymity leads to more feedback on higher-order concerns and that anonymity predicts the processing of certain types of feedback might, in time, benefit the creation of good online peer review programmes, helpful training and online writing instruction.

Good writing is important for communication, both civic and economical, and it is essential for learning (Graham, Gillespie, & McKeown, 2013). Teachers who spend more time on writing, using different successful strategies and learning activities, can help students develop their writing skills and train autonomous writers. Combined with instructional tools such as training students in providing useful, qualitative types of feedback, online peer review can become such a successful learning activity. If that happens, and students increase their English proficiency and become more familiar with online peer feedback, they might start to make better use of the peer feedback process and improve their writing accordingly (Liou & Peng, 2009). This study has tried to provide some insights into the characteristics of online peer review as part of a second-language writing course and it showed that anonymity had a positive effect on the different steps of the online peer review process. Hopefully these insights add to the design and facilitation of online peer review possibilities.

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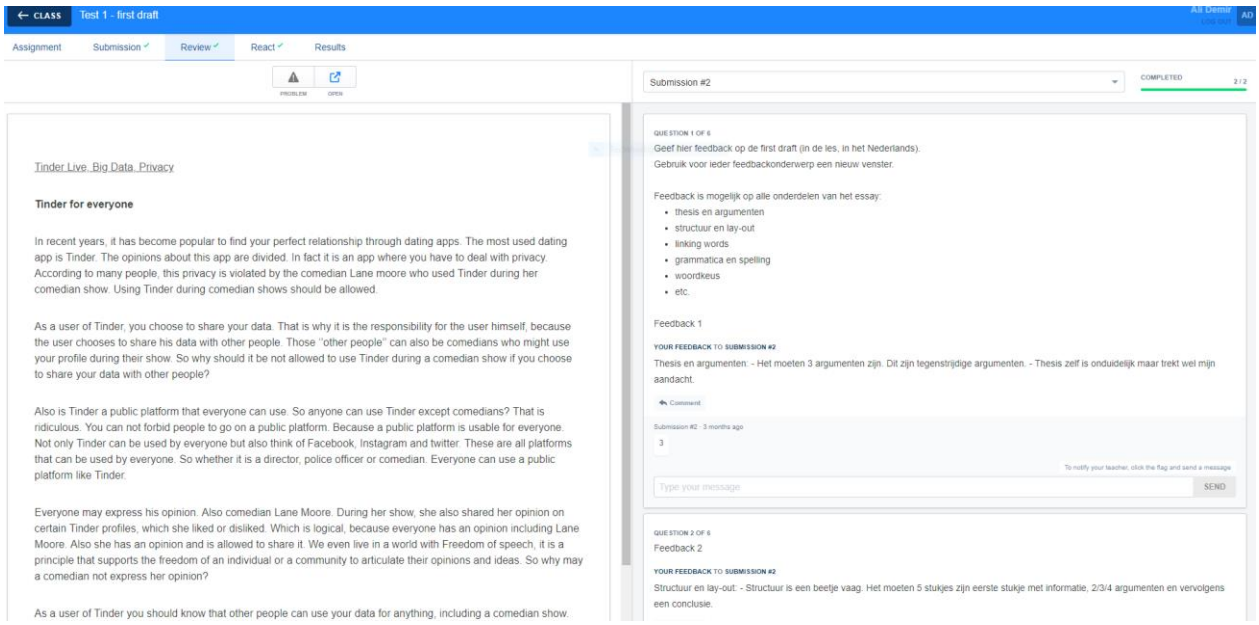
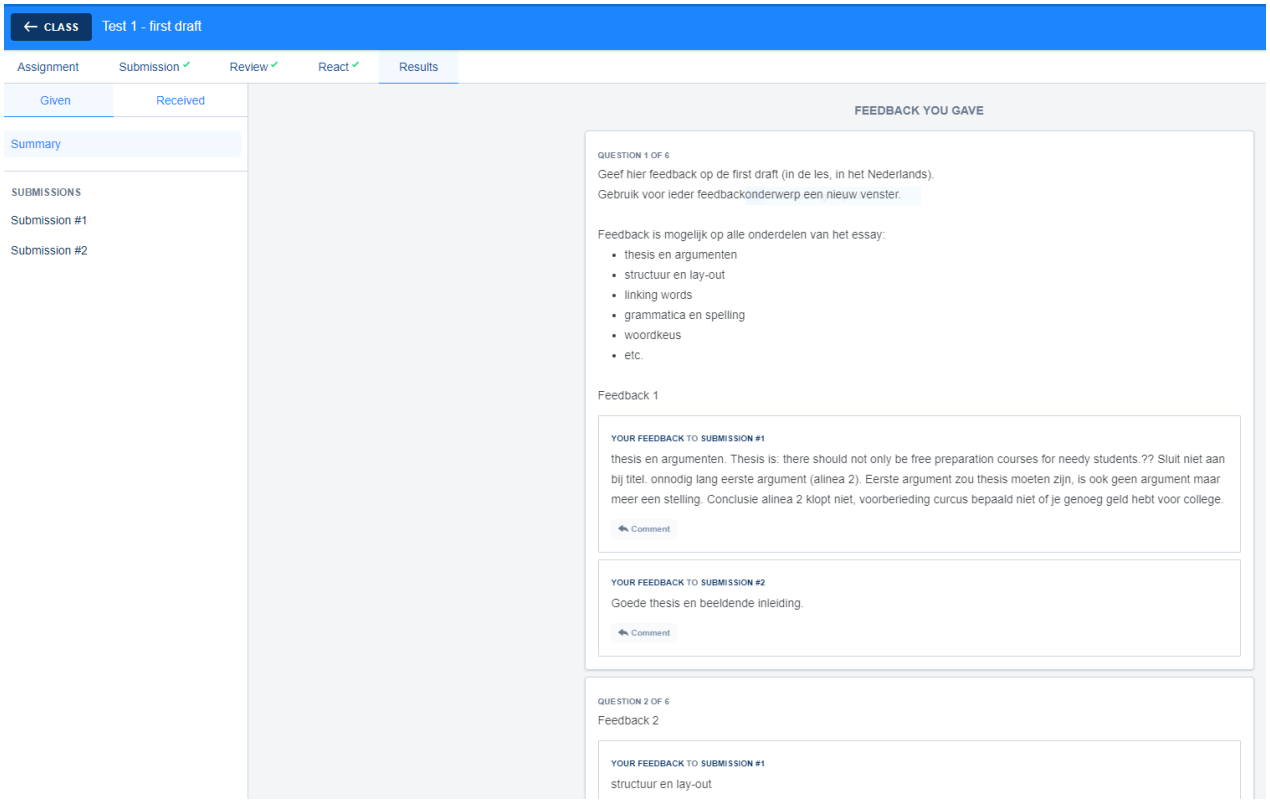
Appendix A – Peergrade.io an impression (anonymous)





Appendix B – Key Writing Power 2

Beoordeling van Deeltoets 1:

Deeltoets 1 (40%)	Voldoende (3) indien:	
Overtuigingskracht & samenhang (20) 5: Heldere thesis	De thesis is sterk en helder geformuleerd (1 zin met 1 centrale mening, gebaseerd op de aangereikte cases, bij voorkeur actueel)	1 / 2 / 3 / 4 / 5
5: Onderbouwing met logische argumenten en voorbeelden	De thesis wordt onderbouwd door helder geformuleerde, logische argumenten en voorbeelden	1 / 2 / 3 / 4 / 5
5: Structuur: introductie-middenstuk-conclusie	De structuur is correct: inleiding (narrative hook, uitleg, opbouw naar thesis) – middenstuk (2 of 3 argumenten, uitleg, illustratie) –conclusie (standpunt in bredere context)	1 / 2 / 3 / 4 / 5
5: Lay-out (titel & alinea's) en voegwoorden	Lay-out is correct, titel is pakkend en sluit aan bij het onderwerp, logische alinea-indeling en voegwoorden	1 / 2 / 3 / 4 / 5
Revisie van de tekst & feedback (20) 10: Geven van relevante feedback	De gegeven feedback is relevant en duidelijk (directief of nondirectief)	2 / 4 / 6 / 8 / 10
10: Verwerken van de ontvangen feedback	Feedback is verwerkt en heeft geleid tot verbetering van de tekst	2 / 4 / 6 / 8 / 10
Voorwaarde	De thesis is gebaseerd op een van de cases van de website: http://cases.ethicsworkshop.org/index.html	

1 = below standard
2 = poor
3 = meets standard
4 = good
5 = above standard

Beoordeling van Deeltoets 2:

Deeltoets 2 (60%)	Voldoende (3) indien:	
Overtuigingskracht & samenhang (20) 5: Heldere thesis	De thesis is sterk en helder geformuleerd (1 zin met 1 centrale mening, gebaseerd op de aangereikte cases)	1 / 2 / 3 / 4 / 5
5: Onderbouwing met logische argumenten en voorbeelden	De thesis wordt onderbouwd door helder geformuleerde, logische argumenten en voorbeelden	1 / 2 / 3 / 4 / 5
5: Structuur: introductie-middenstuk-conclusie	De structuur is correct: inleiding (narrative hook, uitleg, opbouw naar thesis) – middenstuk (2 of 3 argumenten, uitleg, illustratie) –conclusie (standpunt in bredere context)	1 / 2 / 3 / 4 / 5
5: Lay-out (titel & alinea's) en voegwoorden	Lay-out is correct, titel is pakkend en sluit aan bij het onderwerp, logische alinea-indeling en voegwoorden	1 / 2 / 3 / 4 / 5
Aansluiting bij doelgroep (20)		
5: Zinsconstructie	Correcte Engelse zinsbouw (simpel tot complex)	1 / 2 / 3 / 4 / 5
5: Trefzekere woordkeus	Brede, afwisselende woordenschat, sporadische herhalingen	1 / 2 / 3 / 4 / 5
5: Professionele toon	Woordkeus is formeel van toon, gepast en roept nauwelijks vragen op	1 / 2 / 3 / 4 / 5
5: Engelstalige bronnen	Er is gebruik gemaakt van betrouwbare, relevante, Engelstalige bronnen	1 / 2 / 3 / 4 / 5
Grammatica & spelling (20)		
10: grammatica (werkwoorden, voorzetsels, bij- en bijvoeglijk naamwoorden etc.)	De grammatica is grotendeels correct en fouten leiden niet af	2 / 4 / 6 / 8 / 10
10: spelling en interpunctie	Spelling en interpunctie is grotendeels correct en leiden niet af	2 / 4 / 6 / 8 / 10

1 = below standard, 2 = poor, 3 = meets standard, 4 = good, 5 = above standard

Test 1 _____ =

Test 2 _____ = Totaal:

Appendix C – Key Writing Power 1 (pretest)

	Above standard		**Meets standard**		**Below standard**	
Grammaticale correctheid (30): werkwoorden, voorzetsels (10) spelling en interpunctie (10) Engelstalige zinsconstructies (10)	Geen fouten in de werkwoorden en voorzetsels (9-10) Spelling en interpunctie is correct (9–10) Complexe Engelse zinsbouw (9-10)	Geen werkwoord- of voorzetselfouten die de begrijpelijkheid in de weg staan (7-8) Spelling en interpunctie bevatten minimale onregelmatigheden (7-8) Correcte Engelse zinsbouw (7-8)	Enkele fouten in de werkwoordvervoeging en/of voorzetsels die de begrijpelijkheid in de weg staan (5-6) Spelling en interpunctie is grotendeels correct (5-6) Engelse zinsbouw die soms een Nederlandse achtergrond verraadt (5-6)	Veel werkwoordsfouten en voorzetselfouten die de begrijpelijkheid in de weg staan (3-4) Spelling en interpunctie is in meerdere zinnen niet correct (3-4) Mix van Nederlandse en Engelse zinsbouw (3-4)	Bijna iedere zin bevat fouten in werkwoordvervoeging en/of voorzetsels (0-2) De spelling is regelmatig niet correct en/of interpunctie mist (0-2) Veelal Nederlandse zinsbouw (0-2)	
Woordenschat (20): bereik (10) (brede woordenschat) beheersing (10) (gepast en trefzeker)	Brede, afwisselende woordenschat + gebruik van uitdrukkingen (9-10) Woordkeus is trefzeker en eloquent (9-10)	Brede, afwisselende woordenschat. (7-8) Woordkeus is correct, gepast en roept nauwelijks vragen op (7-8)	Toereikende woordenschat, sporadische herhalingen (5-6) Woordkeus verwoordt de ideeën op heldere wijze en is formeel van toon (5-6)	Simpele woordkeus, soms herhaling of te letterlijke vertalingen (3-4) Woordkeus is een mix van formele en informele stijl + roept soms vragen op (3-4)	Beperkte woordkeus met regelmatig herhalingen te letterlijke vertalingen (0-2) Woordkeus is informeel en niet toereikend om ideeën te uiten (0-2)	
Samenhang (20): heldere, coherente structuur (inleiding - middenstuk - conclusie) + lay-out (10) verbindingswoorden (10)	Het artikel heeft een logische, samenhangende, complexe structuur (9-10) Verbindingswoorden versterken de structuur (9-10)	Het artikel heeft een logische, samenhangende structuur (7-8) Verbindingswoorden ondersteunen de structuur (7-8)	Het artikel heeft een logische, simpele opbouw (Q&A) + lay-out, alle topics hebben betrekking op het onderwerp (5-6) Enkele goede verbindingswoorden (5-6)	Lay-out geeft de opbouw aan maar de structuur rammelt en/of informatie is ongelijk verdeeld (3-4) De gebruikte verbindingswoorden leiden af (3-4)	Lay-out en logische opbouw ontbreekt, er is geen centrale vraag/topic. (0-2) Geen of foutief gebruik van verbindingswoorden(0-2)	
Invalshoek (10): aansluiting bij doelgroep (5) Bronnen (5)	Het onderwerp, titel en de geboden informatie zijn opzienbarend en sluiten aan bij een internationaal publiek (5) Meerdere betrouwbare bronnen (5)	Het onderwerp, de titel en inhoud van het artikel zijn interessant voor een internationaal publiek (4) Twee betrouwbare bronnen (4)	De inhoud van het artikel sluit aan bij een internationaal publiek (3) Twee bronnen (3)	De inhoud is gericht op een Nederlands publiek (2) Eén bron of onbetrouwbare bronnen (2)	De inhoud van het artikel is saai / open deur (0-1) Geen bronnen (0-1)	
Productiestrategieën (20): doorlopen van het schrijfproces (10) (uploaden: draft – feedback – definitieve artikel) gebruik maken van (online) ondersteuning (10)	Alle documenten zijn compleet en geüpload (9-10) De opgevraagde feedback was voor alle artikelen kritisch en heeft i.c.m. editing geleid tot perfectionisme (9-10)	Alle artikelen zijn geüpload, maar bij het eerste artikel ontbreekt een onderdeel (7-8) Feedback en editing van alle artikelen heeft verbeteringen opgeleverd (7-8)	Alle artikelen zijn geüpload maar een of twee onderdelen ontbreken of zijn afgeraffeld (5-6) Feedback is steeds grotendeels verwerkt en editing heeft plaatsgevonden (5-6)	Slechts twee artikelen zijn geüpload of artikelen zijn incompleet / voldoen niet aan de opdracht (3-4) Feedback en editing heeft bij twee artikelen tot enkele verbeteringen geleid (3-4)	Student heeft alleen het derde artikel geüpload (1) met draft en feedback (2) Feedback en editing heeft niet zichtbaar plaatsgevonden (0-2)	